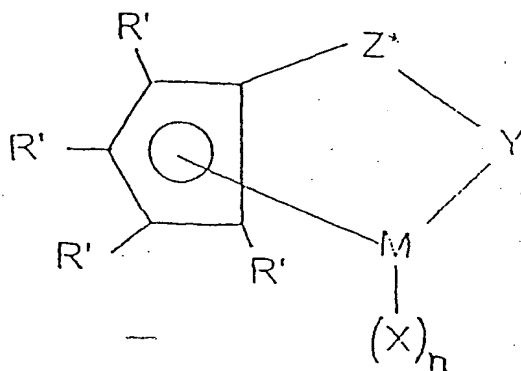


## Claims

1. A supported polymerisation catalyst system comprising the combination of
  - (i) a porous support
  - (ii) a polymerisation catalyst, and
  - (iii) a cocatalyst
- 5 charaterised in that an inert material is added to the porous support.
2. A supported polymerisation catalyst system according to claim 1 wherein the porous support is treated with the inert material prior to the contact of the support with the other components.
3. A supported polymerisation catalyst system according to claims 1 or 2 wherein
  - 10 the inert material is chosen from hydrocarbon liquids, oils or waxes.
4. A supported polymerisation catalyst system according to cliam 3 wherein the hydrocarbon liquid is a C<sub>5</sub>-C<sub>8</sub> alkane.
5. A supported polymerisation catalyst system according to any of the preceding claims wherein the inert material is polyisobutene.
- 15 6. A supported polymerisation catalyst system according to any of the preceding claims wherein the inert material is added to the porous support at less than or equal to the pore volume of the support.
7. A supported polymerisation catalyst system according to any of the preceding claims wherin the porous support is silica.
- 20 8. A supported polymerisation catalyst system according to any of the preceding claims wherein the polymerisation catalyst is a transition metal compound.
9. A supported polymerisation catalyst sytem according to claim 8 wherein the transition metal compound is a metallocene.

10. A supported polymerisation catalyst system according to claim 9 wherein the metallocene has the formula



5 wherein:-

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

10 X is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, siloxyalkyl etc. having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms,

15 Y is -O-, -S-, -NR\*-, -PR\*-,

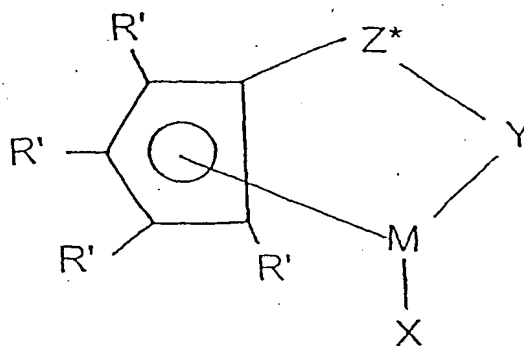
M is hafnium, titanium or zirconium,

Z\* is SiR\*<sub>2</sub>, CR\*<sub>2</sub>, SiR\*<sub>2</sub>SIR\*<sub>2</sub>, CR\*<sub>2</sub>CR\*<sub>2</sub>, CR\*=CR\*, CR\*<sub>2</sub>SIR\*<sub>2</sub>, or GeR\*<sub>2</sub>, wherein:

20 R\* each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said R\* having up to 10 non-hydrogen atoms, and optionally, two R\* groups from Z\* (when R\* is not hydrogen), or an R\* group from Z\* and an R\* group from Y form a ring system.,

and n is 1 or 2 depending on the valence of M.

11. A supported polymerisation catalyst system according to claim 9 wherein the metallocene has the formula



wherein:-

5 R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

10 X is a neutral  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR\*-, -PR\*-;

M is titanium or zirconium in the + 2 formal oxidation state;

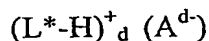
Z\* is SiR\*<sub>2</sub>, CR\*<sub>2</sub>, SiR\*<sub>2</sub>SIR\*<sub>2</sub>, CR\*<sub>2</sub>CR\*<sub>2</sub>, CR\*=CR\*, CR\*<sub>2</sub>SIR\*<sub>2</sub>, or

15 GeR\*<sub>2</sub>, wherein:

R\* each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said

R\* having up to 10 non-hydrogen atoms, and optionally, two R\* groups from Z\* (when R\* is not hydrogen), or an R\* group from Z\* and an R\* group from Y form a  
20 ring system.

12. A supported polymerisation catalyst system according to any of the preceding claims wherein the cocatalyst has the formula



wherein

$L^*$  is a neutral Lewis base

$(L^*-H)^+$  is a Bronsted acid

$A^{d-}$  is a non-coordinating compatible anion having a charge of  $d^-$ , and

$d$  is an integer from 1 to 3.

13. A supported polymerisation catalyst system according to claim 12 wherein the cocatalyst comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

14. A supported polymerisation catalyst system comprising the combination of

- (i) a porous support,
- (ii) a polymerisation catalyst, and
- (iii) a cocatalyst,

*characterised in that* an inert material and a polymerisable monomer are added to the porous support.

15. A supported polymerisation catalyst system according to claim 14 wherein the polymerisable monomer is 1-hexene.

16. A process for the polymerisation of olefin monomers selected from (a) ethylene, (b) propylene (c) mixtures of ethylene and propylene and (d) mixtures of (a), (b) or (c) with one or more other alpha-olefins, said process performed in the presence of a supported polymerisation catalyst system as claimed in any of the preceding claims.

17. A process for the polymerisation of ethylene or the copolymerisation of ethylene and  $\alpha$ -olefins having from 3 to 10 carbon atoms, said process performed under polymerisation conditions in the presence of a polymerisation catalyst system as claimed in claims 1 to 15.

18. A process according to claim 17 wherein the  $\alpha$ -olefin is 1-butene, 1-hexene, 4-methyl-1-pentene or 1-octene.

19. A process according to any of claims 16 to 18 performed in the gas phase.

20. A process according to claim 19 performed in a fluidised bed gas phase reactor.